

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

REC'D 16 JUN 2005

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Applicant's or agent's file reference KWN/C691.1/W	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB 03/04885	International filing date (day/month/year) 11.11.2003	Priority date (day/month/year) 01.04.2003
International Patent Classification (IPC) or both national classification and IPC B24B55/02		
Applicant UNOVA U.K. LIMITED		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
 - ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 03.09.2004	Date of completion of this report 15.06.2005
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Gelder, K Telephone No. +49 89 2399-2035 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/GB 03/04885**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-6 as originally filed

Claims, Numbers

5-19 as originally filed

1-4 received on 03.03.2005 with letter of 03.03.2005

Drawings, Sheets

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

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EXAMINATION REPORT**

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-19
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-19
Industrial applicability (IA)	Yes: Claims	1-19
	No: Claims	

2. Citations and explanations

see separate sheet

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EXAMINATION REPORT - SEPARATE SHEET**

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Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1 Reference is made to the following documents:

D1: D1: GB-A-1 297 095

D2: US-A-6 095 897

D3: PATENT ABSTRACTS OF JAPAN vol. 004, no. 164 (M-041), 14
November 1980 (1980-11-14) -& JP 55 112761 A (DISCO ABRASIVE
SYS LTD), 30 August 1980 (1980-08-30)

2 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 2 does not involve an inventive step in the sense of Article 33(3) PCT.

A method of cooling during grinding a glass workpiece with a rotating grinding wheel, in which a coolant is directed towards the surface of the glass or the edge of the wheel or into the region immediately in the vicinity of the wheel and workpiece point of contact for the purpose of cooling the wheel and the workpiece is generally known, see for example, document D2 which is explicitly directed to methods of grinding discs of glass, cf. col. 1, line 11.

The subject-matter of claim 2 differs from this known D2 in that liquid nitrogen is used as a coolant.

Use of liquid nitrogen for cooling the workpiece, the tool contact region between workpiece and tool in any type of cutting operations including grinding operations has been generally known in the art at the valid filing date, see for example documents D1 and D3, in order to provide a non-oxidising environment and thus reduce staining and to efficiently cool due to the cooling capacity vastly greater than water.

The invention consists thus merely in the use of cryogenic cooling as a common, generally known technique in a closely analogous situation, i.e. grinding of glass. It should be noted that cooling during grinding of glass is not a particular method only known since the year 2000 (D2) to which a very old technique has been applied. Both

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EXAMINATION REPORT - SEPARATE SHEET**

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grinding of glass and liquid nitrogen cooling during machining or cutting of any kind of workpieces have been known long before. It is also noted that the abstract of D3 refers to brittle materials (silicon wafers).

Consequently, the solution proposed in claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT).

- 3 The same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding independent claims 5 and 6, which therefore are also considered not inventive.
- 4 Dependent claims 2 to 4 and 7 to 19 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, see documents D1 to D3.
- 5 Although claims 5 and 6 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.
- 6 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

CLAIMS

1. A method of cooling during grinding a glass workpiece with a rotating grinding wheel, in which liquid nitrogen is directed towards the surface of the glass or the edge of the wheel or into the region immediately in the vicinity of the wheel and workpiece point of contact for the purpose of cooling the wheel and workpiece.
2. A method as claimed in claim 1 wherein the grinding wheel acts to grind a flat or profiled surface of the workpiece.
3. A method of grinding as claimed in claim 1 wherein the workpiece is a glass plate, the grinding wheel acts to grind the edge of the plate, and the liquid nitrogen is directed towards the edge of the glass, or the edge of the wheel, or into the nip between the workpiece and the rotating grinding wheel.
4. A method as claimed in any of claims 1 to 3 wherein the workpiece is rotated during grinding.

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B24B55/02 B24B9/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B24B B23Q B23B B23D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 958 887 A (ENSHU LIMITED) 24 November 1999 (1999-11-24)	1
Y	paragraphs '0001!', '0080!', '0081!; claims 23,24; figures 21,22	2-19
Y	US 6 095 897 A (FALKNER DERMOT ROBERT ET AL) 1 August 2000 (2000-08-01) column 4, line 29-34; figure 2	2-19
X	PATENT ABSTRACTS OF JAPAN vol. 004, no. 164 (M-041), 14 November 1980 (1980-11-14) -& JP 55 112761 A (DISCO ABRASIVE SYS LTD), 30 August 1980 (1980-08-30) abstract	1
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

5 March 2004

Date of mailing of the international search report

16/03/2004

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>PATENT ABSTRACTS OF JAPAN vol. 1995, no. 09, 31 October 1995 (1995-10-31) -& JP 07 156050 A (TOKYO SEIMITSU CO LTD), 20 June 1995 (1995-06-20) abstract; figures</p>	1-19

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0958887	A	24-11-1999	JP 11320328 A	24-11-1999
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			JP 2000044209 A	15-02-2000
			DE 69905971 D1	24-04-2003
			EP 0911113 A2	28-04-1999
			EP 0958887 A2	24-11-1999
			US 6200198 B1	13-03-2001
			US 6135862 A	24-10-2000
US 6095897	A	01-08-2000	AT 255485 T	15-12-2003
			AT 246072 T	15-08-2003
			AT 214321 T	15-03-2002
			AT 211671 T	15-01-2002
			AT 222834 T	15-09-2002
			AU 3042097 A	07-01-1998
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			AU 3042297 A	07-01-1998
			CN 1222107 A ,B	07-07-1999
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			DE 69709924 D1	28-02-2002
			DE 69711022 D1	18-04-2002
			DE 69711022 T2	18-07-2002
			DE 69714995 D1	02-10-2002
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			DE 69723881 D1	04-09-2003
			DE 69723881 T2	22-01-2004
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			EP 1005955 A2	07-06-2000
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			EP 0865342 A1	23-09-1998
			EP 0907461 A1	14-04-1999
			EP 0906174 A1	07-04-1999
			EP 0904893 A2	31-03-1999
			ES 2170955 T3	16-08-2002
			ES 2171262 T3	01-09-2002
			ES 2183181 T3	16-03-2003
			GB 2348837 A ,B	18-10-2000
			WO 9748522 A1	24-12-1997
			WO 9748526 A1	24-12-1997
			WO 9748525 A1	24-12-1997
			GB 2316637 A ,B	04-03-1998
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			GB 2322319 A ,B	26-08-1998
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			GB 2337111 A ,B	10-11-1999
			JP 11320362 A	24-11-1999
			JP 2000117602 A	25-04-2000
			JP 2000512564 T	26-09-2000
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			JP 2000296446 A	24-10-2000
			JP 2003251557 A	09-09-2003
			KR 2000016637 A	25-03-2000

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Information on patent family members

PCT/GB 03/04885

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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JP 55112761	A	30-08-1980 JP 63062339 B	02-12-1988
JP 07156050	A	20-06-1995 NONE	

1/3

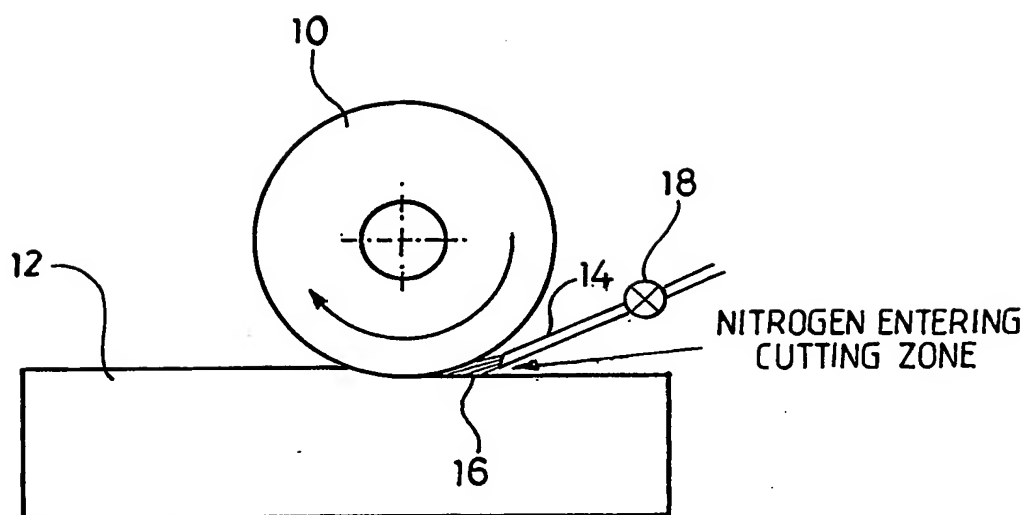


Fig. 1

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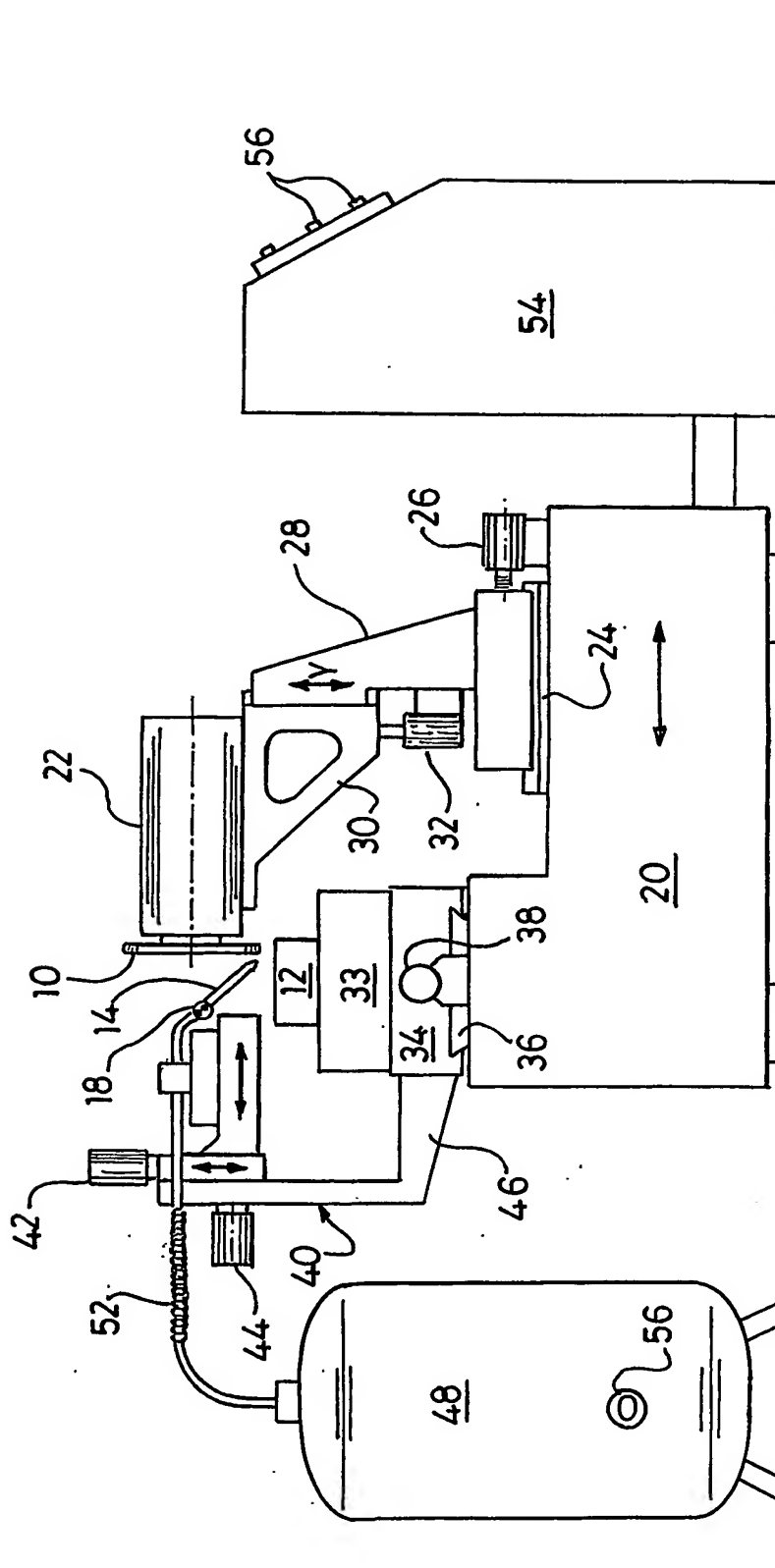


Fig. 2

